

San Mateo County Adult NMT Pilot Final Evaluation Report, 2016-2020

A Mental Health Services Act Innovation Project



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Introduction

Project Overview and Learning Goals

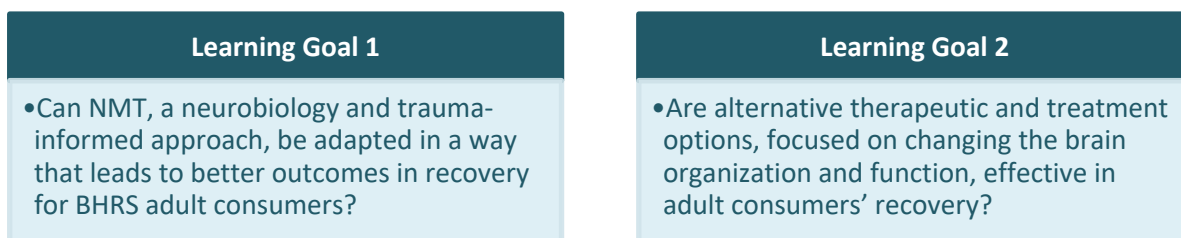
San Mateo Behavioral Health and Recovery Services (BHRS) implemented the Neurosequential Model of Therapeutics© (NMT) within the Adult System of Care as part of the three-year Mental Health Services Act (MHSA) Innovation (INN) plan. The MHSA INN project category and primary purpose of the NMT pilot project are as follows:

- **MHSA INN Project Category:** Makes a change to an existing mental health practice that has not yet been demonstrated to be effective.
- **MHSA Primary Purpose:** Increase quality of mental health services, including measurable outcomes.
- **Project Innovation:** While NMT has been integrated into a variety of settings serving infants through young adults, there is no literature or research of NMT in a strictly adult setting or population. BHRS intends to adapt, pilot, and evaluate the application of the NMT approach to an adult population with a history of trauma. This expansion to and evaluation of NMT in an adult system of care is the first of its kind.

The Mental Health Services Oversight and Accountability Commission (MHSOAC) approved the project on July 28, 2016 and BHRS began implementation in September 2016. In 2017, BHRS contracted Resource Development Associates (RDA) to evaluate the adult NMT pilot project.

BHRS developed two learning goals to guide the NMT pilot and assess the extent to which the program is meeting its intended MHSA objectives—to increase the quality of services and consumer outcomes. The learning goals are outlined in Figure 1 below. The first learning goal pertains to the adaptation and implementation of the NMT approach in the adult consumer population, while the second learning goal pertains to the effectiveness and impact of the NMT approach in improving recovery outcomes.

Figure 1. NMT Pilot Project Learning Goals



This final report follows three previous annual evaluation reports (2016-17, 2017-18, and 2018-19) that presented year-to-year accounts of the NMT adult pilot program development outcomes. This cumulative evaluation report presents cross-cutting findings and “lessons learned” during the evaluation period.



Project Need

Through the MHSA Community Planning Process in San Mateo, BHRS and community stakeholders identified the need to provide alternative treatment options to broaden and deepen the focus on trauma informed care and provide better outcomes in recovery for adult BHRS consumers. To address this need, BHRS proposed implementing the NMT approach within the BHRS Adult System of Care. NMT is an innovative approach to treating trauma that is grounded in neurodevelopment and neurobiology. Subsequent sections provide a more in-depth description of NMT and its application to adults.

NMT Background

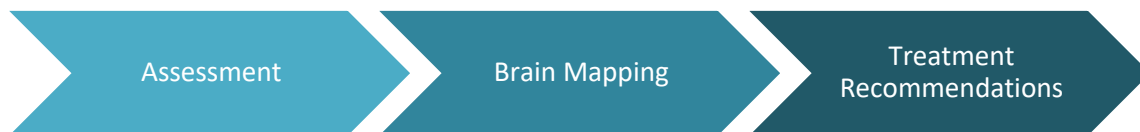
The Child Trauma Academy (CTA) developed NMT as an alternative approach to addressing trauma, typically used with children, that is grounded in neurodevelopment and neurobiology. NMT is not a single therapeutic technique or intervention. Rather, NMT uses assessments to guide the selection and sequence of a set of highly individualized therapeutic interventions (e.g., therapeutic massage, drumming, yoga, expressive arts, etc.) that best match each NMT consumer’s unique strengths and neurodevelopmental needs.¹

NMT is guided by the principle that trauma during brain development can lead to dysfunctional organization of neural networks and impaired neurodevelopment. The selected set of therapeutic interventions intends to help change and reorganize the neural systems to replicate the normal sequence of brain and functional development. Selected interventions first target the lowest, most abnormally functioning parts of the brain. Then, as consumers experience functional improvements, interventions are selected that target the next, higher brain region. The sequence of interventions aims to help consumers better cope, self-regulate, and progress in their recovery.

NMT Processes and Activities

As depicted in Figure 2, the NMT process consists of three main phases: 1) assessment, 2) brain mapping, and 3) the development of individualized treatment recommendations. These phases are briefly described below.

Figure 2. Key phases of the NMT Process



¹Perry, B.D. & Hambrick, E. (2008) The Neurosequential Model of Therapeutics. *Reclaiming Children and Youth*, 17(3), 38-43.



Assessment. NMT-trained providers collect information pertaining to the consumer’s history of adverse experiences—including their timing, nature, and severity—as well as any protective factors. This information is used to estimate the risk and timing of potential developmental impairment. The assessment also includes an examination of current functioning and relationship quality (e.g., with parents, family, peers, community, etc.).

Brain Mapping. NMT-trained providers enter assessment data into a web-based tool designed by the CTA, which uses assessment data to generate a brain map illustrating the brain regions most affected by developmental impairment. Through this “mapping” process, scores are calculated in four functional domains: 1) Sensory integration, 2) Self-regulation, 3) Relational, and 4) Cognitive. The functional domain values are compared with age typical domain values to assess the degree of developmental impairment and identify the consumer’s functional strengths and challenges.

Treatment Recommendations. Therapeutic interventions are identified that address the consumer’s needs in the four functional domains, first targeting the lowest brain regions with most severe impairment. Throughout treatment, assessments and brain mapping are performed at regular intervals to evaluate any changes in functional domains, and treatment recommendations are adapted as appropriate.

NMT Training

CTA offers two levels of training: Phase I NMT Certification training, and Phase II “Train-the-Trainer” training for providers already certified in NMT. The NMT training model, for both Phase I and Phase II trainings, relies on a case conference or group supervision approach with intensive self-study. To conduct their self-study, providers receive a detailed training syllabus with a variety of web-based training materials and resources—including videos, lectures, recordings, readings, and case studies—allowing providers to work through the content at their own pace.

Providers must also participate in a monthly meeting, or case conference, wherein providers discuss real-life cases. These group discussions are the foundation for supervision of NMT implementation, provide opportunities for clinicians to refine their knowledge and skills, and allow for fidelity monitoring. Throughout the course of the training, trainees are also expected to conduct NMT assessments and interventions.

Certified NMT providers must then complete fidelity assessments annually, wherein providers evaluate the same client data and inter-rater reliability scores are calculated. NMT training is designed to be completed over the course of approximately one year, although the self-directed nature of the training allows the training to be extended as needed.



The Phase I and Phase II training structure is briefly described below:

- **Phase I training:** The Phase I training providers attend an initial in-person training that teaches the core principles of NMT. After this initial training, providers begin conducting their self-study and implementing NMT, often with the support of an NMT mentor. Throughout the training, trainees also participate in NMT study groups and learning communities. To graduate the training, providers must complete at least 10 NMT assessments.
- **Phase II training:** The Phase II training to prepare NMT clinicians to become NMT trainers or mentors. The structure and format of the Phase II training is similar to Phase I, and includes a combination of self-study, monthly meetings, and conducting NMT assessments. However, the Phase II training examines NMT principles in greater depth. Like the Phase I training, Phase II clinicians must conduct at least 10 NMT assessments. By the end of the Phase II training, providers are expected to be able to lead the core principles training and mentor providers in the Phase I training.

Application of NMT to Adults

Since its development, NMT has been most widely used with children who experienced maltreatment and/or trauma, and BHRS has been using the NMT approach with children since 2012. However, the use of NMT with adults is limited. Given the high prevalence of trauma among adult behavioral health consumers and the relationship between childhood trauma and behavioral health issues in adulthood, there is a strong theoretical basis to predict that adult mental health consumers could benefit from the NMT approach.^{2,3}

Nevertheless, NMT's effectiveness in the adult population is unknown. As mentioned, NMT has not been formally implemented into an adult system of care, and no outcome studies have been conducted to evaluate NMT in an adult population. BHRS is adapting, piloting, and evaluating the application of the NMT approach to an adult population with hopes of increasing the quality of mental health services and improving recovery outcomes for adult mental health consumers with a history of trauma.

²It is estimated that 40-80% of adults with mental illness and/or substance use issues also have experiences of trauma.

Source: Missouri Institute of Mental Health. (2004). Trauma among people with mental illness, substance use disorders and/or developmental disabilities. *MIMH Fact Sheet, January 2004*. Retrieved from:
<https://dmh.mo.gov/docs/mentalillness/traumafactsheet2004.pdf>

³Anda, R.F., Felitti, V.J., Bremner, J.D., Walker, J.D., Whitfield, C., Perry, B.D., ... Giles, W.H. (2006). The enduring effects of abuse and related adverse experiences in childhood: a convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience*, 256(3), 174-186.



Project Description and Timeline

BHRS NMT Pilot Project

NMT Providers

As mentioned, BHRS has been using the NMT approach with youth since 2012. Prior to beginning the NMT adult pilot, 30 clinical staff in the BHRS Child and Youth System of Care and 10 clinical staff from community-based partner agencies received training through CTA. In addition, 10 BHRS providers became certified NMT trainers, and certify other providers in NMT through the CTA training. These trainers serve as mentors to NMT trainees and teach NMT principles and provide consultation to other providers. To expand NMT to the adult population, BHRS began training providers within the Adult System of Care in January 2017. The providers work in a variety of settings, including BHRS specialty mental health or regional clinics and programs serving consumers re-entering the community following incarceration.

Target Population

BHRS estimates that the adult NMT pilot project will serve approximately 75 to 100 adult consumers annually once the BHRS providers in the Adult System of Care are fully trained. Providers refer existing BHRS consumers from their caseloads to NMT, targeting three adult mental health populations:

- General adult consumers (ages 26+) receiving specialty mental health services;
- Transition age youth (TAY) consumers (ages 16-25); and
- Criminal justice-involved consumers re-entering the community following incarceration.

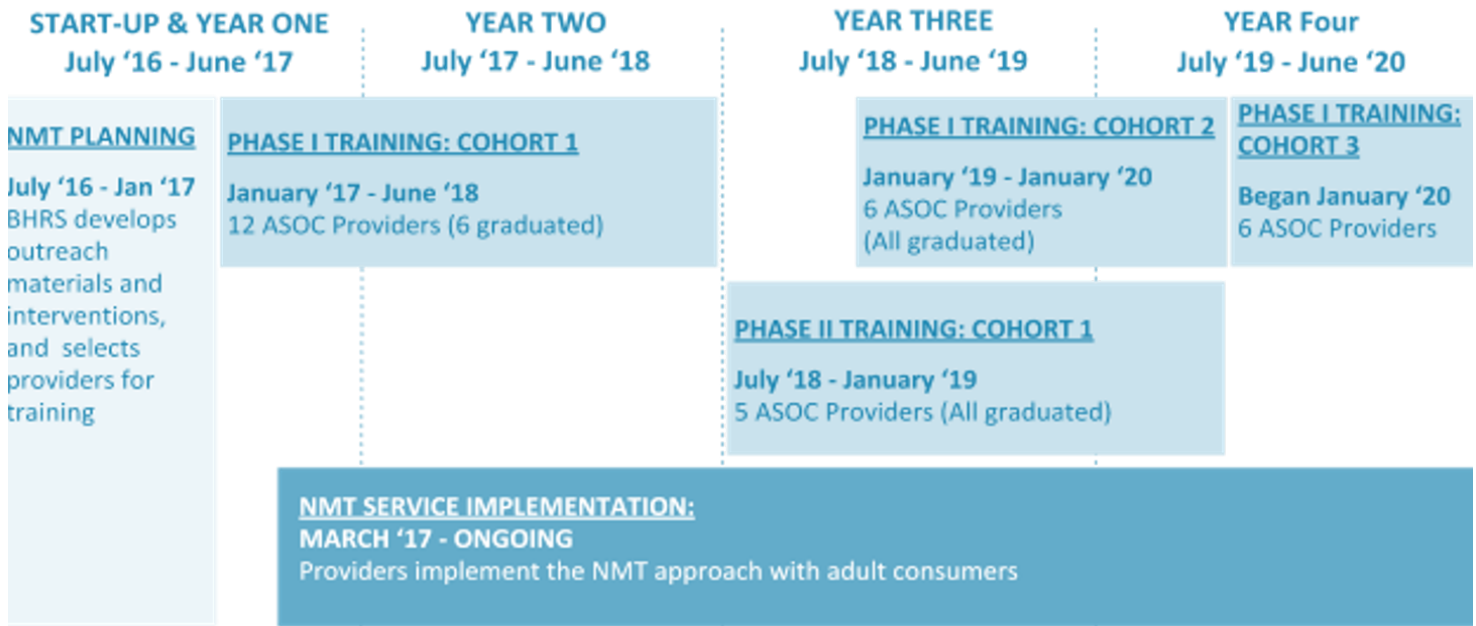
The three target populations likely have different experiences, needs, and coping skills and, as a result, could respond to NMT differently. For example, TAY are still undergoing brain development and therefore may be more responsive to neurodevelopmental treatment approaches such as NMT. In addition, the re-entry population might have different coping mechanisms than the general adult and TAY consumer populations, such as engaging in high-risk behaviors that might lead to incarceration. For the re-entry population, the experience of incarceration could also further contribute to trauma.



Implementation Timeline

Figure 3 illustrates the key activities that took place during the NMT adult pilot project.

Figure 3. NMT Implementation Timeline



Impact of COVID-19 on NMT Adult Pilot Project

NMT pivoted to a virtual service model in the spring of 2020 in response to COVID-19. NMT provider training as well as NMT assessments and interventions with consumers were conducted remotely, with services predominantly provided over the phone or through video conferencing. Only consumers with severe needs or who were receiving treatment in residential placements continued to receive services in-person. Additionally, the Phase I training that began in January 2020 was extended from 12 to 18 months, ending in June 2021 rather than December 2020, to give trainees more time to complete training requirements during the pandemic.

Some consumers did not have the appropriate equipment or technology for video conferencing, while others had limited or unreliable access to phones. Some consumers also found it more challenging or were less willing to engage in remote services. Given the difficulty in engaging some consumers, BHRS opened fewer new consumers to NMT services during shelter-in-place. When possible, providers continued to provide NMT interventions and follow-up assessments with existing consumers.



Evaluation Overview

As mentioned, BHRS contracted RDA to evaluate the pilot and support project learning. In order to maximize RDA's role as research partners, RDA collaborated with BHRS and CTA when planning the evaluation—including identifying evaluation goals, validating the theory of change for NMT specific to the adult population, identifying the types of variables that may support or complicate outcomes in adults, and developing data collection tools to measure program implementation and consumer outcomes.

To guide the NMT evaluation, RDA developed evaluation sub-questions associated with each learning goal. The evaluation questions (EQ) are listed below. To the extent possible, the evaluation examined implementation and outcome differences across the three target populations to identify how BHRS could adapt the NMT approach to best meet each population's unique needs.

Learning Goal 1: Can NMT, a neurobiology and trauma-informed approach, be adapted in a way that leads to better outcomes in recovery for BHRS adult consumers?

EQ 1.1. How is the NMT approach being adapted to serve an adult population?

EQ 1.2. Who is being served by the adult NMT project, what types of NMT-based services are consumers receiving, and with what duration and frequency?

Learning Goal 2: Are alternative therapeutic and treatment options, focused on changing the brain organization and function, effective in adult consumers' recovery?

EQ 2.1. To what extent is the NMT approach supporting improvement in adult consumers' functional outcomes and overall recovery and wellbeing?

EQ 2.2. To what extent is the experience of care with the NMT approach different from consumers' previous care experiences?

The evaluation examines both Learning Goals to: 1) identify how NMT implementation progressed as the program matured and 2) examine changes in consumers' functional and recovery outcomes as consumers participated in NMT.



Evaluation Methods

Data Collection

RDA employed a mixed-methods evaluation approach (i.e., using both qualitative and quantitative data) to identify who participated in NMT, how BHRS is adapted the NMT approach for the adult population, and preliminary consumer outcomes. This report includes information about NMT implementation as well as consumer outcomes for adults who were open to NMT services during the evaluation period—September 2016 through June 2020. RDA worked closely with BHRS to identify and obtain appropriate outcome measures and data sources to address the evaluation questions. Table 1 outlines the outcome data available for this report as well as the respective data sources.

Table 1. Measurable Outcomes and Data Sources

Outcome Type	Outcome Measures	Data Sources
Process Outcomes	Number of consumers participating in NMT services	Electronic Health Records
	Characteristics of NMT consumers	Electronic Health Records
	Provider experience of NMT training and NMT implementation with the adult population	Provider Focus Groups
	Types of recommended NMT interventions	Consumer and Provider Focus Groups and NMT Database
Consumer Outcomes	Changes in brain map and functional domain scores	NMT Database
	Perceived impact of NMT services on consumer functional and recovery outcomes	Consumer and Provider Focus Groups
	Consumer experience of NMT services	Consumer Focus Group

Quantitative data: RDA collected quantitative data about NMT consumers from two main sources: 1) BHRS’s Electronic Health Record (EHR) system, Avatar, and 2) the NMT Database operated by CTA, which includes brain map and functional domain scores and recommended NMT interventions.

Qualitative data: RDA also collected qualitative data through discussions with BHRS NMT providers, non-NMT trained BHRS providers, and NMT consumers. Throughout the evaluation period, RDA conducted a total of 10 focus groups, including the following:⁴

- 5 focus group discussions with BHRS providers participating in NMT training (37 total participants)
- 1 focus group discussion with non-NMT-trained BHRS providers (5 total participants)
- 4 focus group discussions with NMT consumers (13 total participants)

Focus groups with BHRS providers centered on providers’ experience of NMT training, how they adapted the NMT approach with the adult population, and implementation successes and challenges. Discussions with consumers focused on their experience with NMT services, how NMT services differed from other mental health services received, and the perceived impacts of NMT on their wellness and recovery.

⁴ The number of focus group participants are not unique participants as some individuals participated in more than one focus group throughout the evaluation period.



RDA employed a trauma-informed, culturally sensitive approach when engaging with and gathering information from NMT consumers, as RDA recognizes that most NMT consumers have experienced multiple forms of trauma. Our interviewers and facilitators were trained to bring an awareness of their own positionality and biases, as well as to ask questions in a sensitive and trauma-informed manner that gives participants voice and choice to share their stories and experiences.

Data Analysis

To analyze the quantitative data (e.g., consumer characteristics and service utilization), RDA used descriptive statistics to examine frequencies and ranges. When the sample size was large enough, RDA also explored differences in outcomes across different sub-populations (e.g., adults, TAY, criminal justice involved adults, etc.). To analyze qualitative data, RDA transcribed focus group participants' responses to appropriately capture the responses and reactions of participants. RDA then thematically analyzed responses from participants to identify commonalities and differences in participant experiences.

Data Limitations

NMT service duration and frequency. As part of NMT pilot implementation, BHRS created an NMT episode code to identify consumers who received NMT assessments and participated in NMT-based services. However, an NMT service code could not be created as NMT is an approach to therapy rather than a specific service. Without an NMT service code, it was difficult to determine the duration and frequency of NMT services. This limited analyses and the ability to quantitatively determine whether individuals who participated in NMT-based services more frequently or for a longer duration had improved outcomes compared to those who engaged in NMT less frequently or for a shorter time period.

NMT follow-up assessments. Follow-up assessment data were available for half of consumers. To calculate the change in assessment metrics, RDA used the most current metric compared to the consumers' baseline metric. However, the time between consumers' baseline and most current metric varied widely, from 4 months to approximately 4 years. Given the relatively small number of consumers with follow-up assessments and the varying length of time between assessments, NMT assessment findings should be considered exploratory.



Program Reach

Over the course of the NMT adult pilot project, the volume of adult consumers participating in NMT services grew each year. During year 1, 20 adult consumers participated in NMT services, compared to 40 consumers in Year 2, 77 consumers in Year 3, and 90 consumers in Year 4. Additionally, as the pilot progressed, providers completed more follow-up assessments to assess changes in functional outcomes. During the first year, no follow-up assessments had been completed, while 11 follow-up assessments were completed in year 2, 28 were completed in year 3, and 46 were completed as of the end of year 4. As mentioned, the volume of new consumers served in Year 4 was slightly lower than in previous years due to COVID-19.

Through the NMT adult pilot project, a total of 29 providers within the Adult System of Care participated in NMT training. BHRS conducted three cohorts of Phase I NMT certification training. Twelve providers in the Adult System of Care participated in the first cohort, with six completing the training. In the second cohort, 6 ASOC providers enrolled in and completed the training, and six additional ASOC providers began the third training cohort. The third cohort was still participating in the Phase I training as of the end of the pilot period; trainees are expected to complete the training in June 2021. In addition to the three cohorts of Phase I training, BHRS also conducted a Phase II Train-the-Trainer training. Five providers in the Adult System of Care enrolled in and completed the Phase II training, and became NMT trainers and mentors to Phase I trainees.



NMT Consumer Profile

The following section describes the consumer population that participated in NMT services throughout the pilot project period, including demographic information, behavioral health diagnoses, behavioral health service utilization, and baseline NMT assessment information.

Demographic Information

As mentioned previously, BHRS aimed to serve three adult populations through the NMT pilot project: adult consumers (ages 26+) receiving specialty mental health services, TAY (ages 16-25) receiving mental health services, and criminal justice-involved consumers re-entering the community following incarceration.

Throughout the adult NMT pilot project, 90 adult consumers received NMT services, all of whom reflect the intended target population. Overall, the average age of consumers was 34, with ages ranging from 17 to 70. Most consumers (n=61, 68%) were adults ages 26 and older, while 29 consumers (32%) were TAY. In addition, at least 33 consumers (37%) were also part of the re-entry population, almost all of whom were adults ages 26 and older (85%, n=28).⁵

Figure 4. NMT Consumer Population, N=90



Table 2 describes the demographic characteristics of the NMT consumers.⁶ Two-thirds of consumers reported they were female (n=58, 64%) and one-third reported they were male (n=32, 36%); no consumers reported a different sex.⁷ Although the largest racial group was White (n=26, 29%), approximately a quarter of consumers each reported they were two or more races (n=21, 23%) or reported their race as Other (n=24, 27%). A smaller proportion of consumers reported their race as Black or African American (n=6, 7%) or Asian/Pacific Islander (n=5, 6%). Nearly half of consumers also reported their ethnicity as Hispanic/Latino (n=39, 43%). Race was unknown or unreported for 8 consumers, and ethnicity was not reported for 10 consumers.

⁵Consumers were identified as part of the criminal justice/re-entry population if they received behavioral health services in custody, services through the BHRS mental health court, or services through a provider aimed at serving the re-entry population (e.g., Service Connect).

⁶In accordance with HIPAA, demographic categories comprised of fewer than five consumers were aggregated to protect consumer privacy.

⁷Information regarding gender identity was not available for this report.



The majority of consumers (n=73, 81%) reporting speaking English only, while 16% of consumers reported speaking Spanish (n=14), and 3% reported another language (n=3). Most consumers reported they were heterosexual (n=61, 68%), while 13% (n=12) reported they were another sexual orientation. One consumer declined to state their sexual orientation, while sexual orientation was unknown or unreported for 16 consumers. Two-thirds of consumers (n=60, 67%) had a known disability. No consumers reported that they were a veteran.

Table 2. Demographic Characteristics of Consumers (N=90)

Characteristic	Consumers	% of Total
Age		
Ages 16 to 25	29	68%
Ages 26+	61	32%
Gender		
Female	58	64%
Male	32	36%
Race		
White	26	29%
Black or African American	6	7%
Asian/Pacific Islander	5	6%
Other Race	24	27%
Two or More Races	21	23%
Unknown/ Not Reported	8	9%
Ethnicity		
Hispanic/Latino	39	43%
Not Hispanic/Latino	41	46%
Unknown/ Not Reported	10	11%
Primary Language		
English	73	81%
Spanish	14	16%
Other	3	3%
Sexual Orientation		
Heterosexual	61	68%
LGBTQ+ ⁸	12	13%
Declined to State	1	1%
Unknown/ Not Reported	16	18%
Disability		
Any Disability	60	67%
No Known Disability	30	33%

⁸LGBTQ+ refers to lesbian, gay, bisexual, transgender, questioning or gender queer, intersex, asexual, or other sexual orientations.



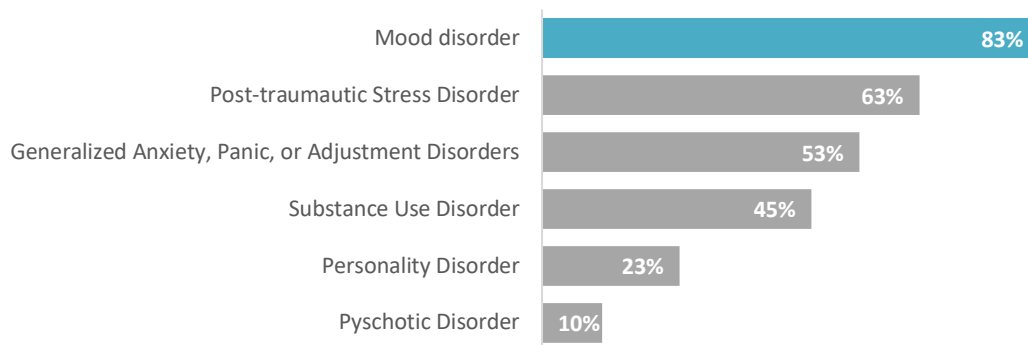
Behavioral Health Diagnoses

Consumers who participated in NMT had a variety of mental health diagnoses. Typically, the majority of adult consumers receiving specialty mental health services within adult systems of care have been diagnosed with a psychotic disorder (e.g., schizophrenia or schizoaffective disorder) or a mood disorder (e.g., bipolar or major depressive disorders). However, as shown in Figure 5, the NMT population served had a wider variety of behavioral health diagnoses. Consumers may have more than one behavioral health diagnosis; as a result, percentages add to greater than 100%.

The most common diagnosis was a mood disorder; 83% (n=75) of consumers were diagnosed with a depressive or bipolar disorder. Of those, most were diagnosed with a major depressive disorder while a smaller subset was diagnosed with bipolar disorder or an unspecified mood disorder. Nearly two-thirds of consumers (63%, n=57) were diagnosed with a posttraumatic stress disorder (PTSD), and half (53%, n=48) were diagnosed with a generalized anxiety, panic, or adjustment disorder. Only 10% of consumers (n=9) were diagnosed with a psychotic disorder. In addition to these mental health diagnoses, 23% (n=21) also had a diagnosed personality disorder.

Substance use is also prevalent among the population served, wherein nearly half of consumers (n=41, 45%) had a documented co-occurring substance use disorder. Of these consumers, most reported using several substances, while some were diagnosed with specific cannabis, alcohol, opioid, stimulant, or other substance use disorders. Most consumers with documented substance use disorders were also part of the criminal justice re-entry population.

Figure 5. Behavioral Health Diagnoses of NMT Consumers, N=90



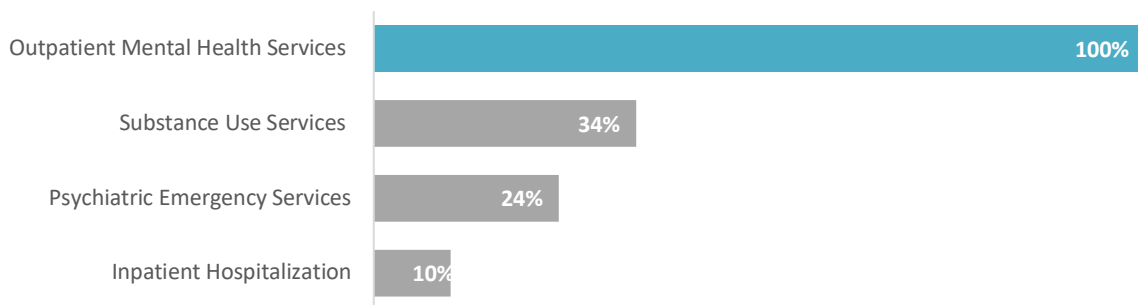
The breadth of diagnoses aligns with some of the diagnostic challenges that arise when working with individuals who have experienced significant trauma. Adults who have experienced trauma often have a more complex clinical presentation, frequently characterized by symptoms of anxiety, depression, and other mood fluctuations as well as substance misuse. Symptoms reflective of trauma may not clearly align to any one diagnosis within the existing diagnostic classification systems (e.g., DSM-IV TR or DSM-V). The relatively high prevalence of documented personality disorders may also be indicative of pervasive childhood trauma.



Behavioral Health Service Utilization

All consumers who received NMT services were enrolled in and receiving outpatient mental health services, which aligns with the model of integrating NMT within existing mental health services rather than creating a stand-alone program. In addition to outpatient mental health services, one-third of consumers (n=31, 34%) also participated in outpatient and/or residential substance use services. Of these consumers, seven also participated in detoxification services in the year prior to enrollment. Additionally, one-quarter of consumers (n=22, 24%) experienced a mental health crisis that required psychiatric emergency services, and 10% of consumers experienced inpatient hospitalizations in the year prior to enrollment.

Figure 6. Behavioral Health Service Utilization, N=90



Baseline NMT Assessments

Baseline Brain Map and Functional Domain Scores

As mentioned previously, NMT-trained providers enter assessment data into a web-based tool designed by CTA that uses the assessment data to generate a brain map illustrating the brain regions most likely to be affected by developmental impairment. Through this mapping process, scores are calculated in four functional domains: 1) Sensory integration, 2) Self-regulation, 3) Relational, and 4) Cognitive. The brain map and functional domain values can then be compared with age typical values to assess the degree of developmental impairment and identify the consumer's functional strengths and challenges.

These functional domains are defined as follows:

- **Sensory Integration** refers to a set of functions that integrate, process, store, and act on sensory input from outside (e.g., visual, auditory) and inside (e.g., metabolic) the body.
- **Self-Regulation** refers to a broad set of functions that modulate and regulate the activity of other key systems in other parts of the body and brain, such somatosensory and emotional regulation.
- **Relational** refers to the complex set of relationship-related functions such as bonding, attachment, attunement, reward, empathy, and related emotional functions.
- **Cognitive** refers to the myriad functions involved in complex sensory processing, speech, language, abstract cognition, reading, future planning, perspective-taking, moral reasoning, and similar cognitive capabilities.



As of the end of the reporting period, baseline assessment data were completed and available for 82 consumers. Of these 82 consumers, 67% were adults (n=55) and 33% were TAY (n=27). Additionally, 39% (n=32) were part of the reentry population.

For each consumer, functional domain values were compared with age typical values to calculate the percent of age typical functional domain score. A score of 100% indicates normal functioning with respect to a person’s age. A score lower than 100% indicates some degree of impairment, wherein lower scores correspond to greater impairment. For example, a functional domain score of 70% indicates greater impairment than a score of 80%. The average baseline scores for the total brain map and each of the functional domains are illustrated in Figure 7.

Consumers’ average baseline brain map score was 77%. However, the values ranged widely from 29% (indicating a high degree of impairment) to 100% (indicating normal functioning). Consumers appeared to have relatively high functioning in the sensory integration and cognitive domains at baseline, while baseline functioning in the self-regulation and relational domains tended to be slightly lower. For both the sensory integration score and cognitive domains, the average score was approximately 81% (sensory integration range: 38% to 100%, cognitive range: 15% to 100%). In comparison, for both self-regulation and relational domains, the average score was approximately 71% (self-regulation range: 34% to 100%, relational range: 27% to 100%).

Figure 7. Average Baseline Brain Map and Functional Domain Scores, N=82



Level of NMT Recommended Interventions

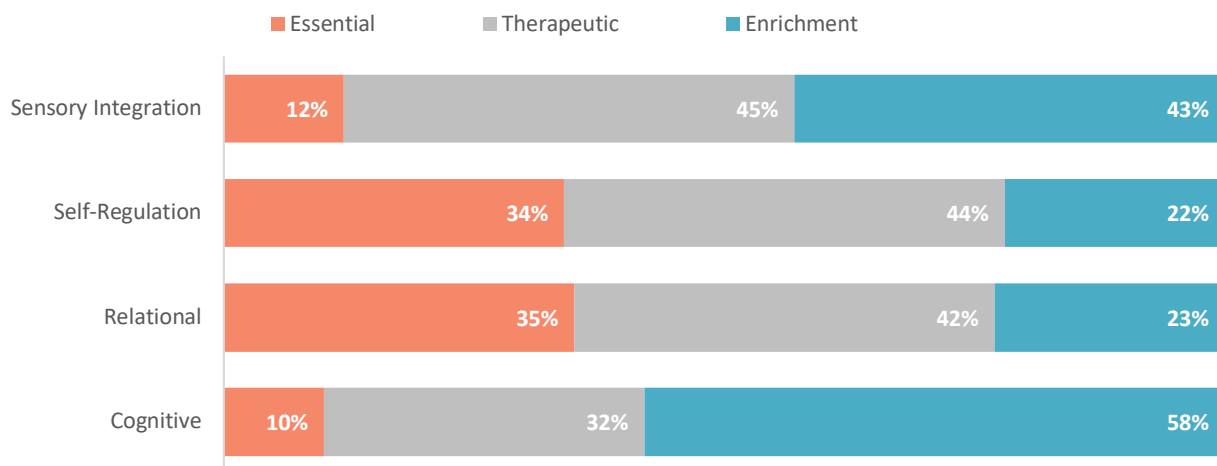
As discussed, brain map and functional domain scores are used to highlight the consumers’ functional strengths and needs. This information can then be used to develop broad recommendations for the types and intensity of NMT interventions that consumers should receive to promote growth and recovery. To guide treatment planning, CTA developed cut-off scores to indicate whether interventions targeting each of the functional domain areas are recommended as essential, therapeutic, or enrichment. These recommendation categories, or levels, are described in greater detail below:



- **Essential:** Functional domain score is <65% of age typical. At the essential level, activities are considered crucial for future growth in the given domain. If functioning in the essential area is not increased, the individual will lack the foundation for future growth and development in this and other areas.
- **Therapeutic:** Functional domain score is 65-85% of age typical. At the therapeutic level, activities are aimed at building strength and growth in the particular area. Therapeutic activities are viewed as important for continued growth and development.
- **Enrichment:** Functional domain score is >85% of age typical. At the enrichment level, activities provide positive, valuable experiences that continue to build capacity in the given area.

The recommended level of interventions reflects the relatively high functioning of consumers in the cognitive and sensory integration domains, compared to the self-regulation and relational domains (Figure 8). In both the sensory integration and cognitive domains, interventions for approximately half of consumers were recommended as enrichment, whereas interventions were recommended as essential for only 10% of consumers. In comparison, for the self-regulation and relational domains, only 20% of consumers had interventions recommended as enrichment while over 30% had interventions recommended as essential.

Figure 8. NMT Recommendation Categories across Functional Domains, N=82



Differences Across Target Populations

Overall, there were no significant differences between adults and TAY in the baseline functional domain scores and the recommended level of NMT interventions. Although, adults appeared to have a slightly wider range in functional domain scores. Additionally, baseline values were similar among adults in the re-entry population and adults who were not criminal justice involved. Baseline functional domain scores and baseline recommended level of interventions information for each of the target populations are available in Appendix I.



Final Progress Toward Learning Goals

Summary of Key Findings

This section discusses the progress that the BHRS NMT Pilot has made toward achieving its two learning goals. Key findings are summarized below, followed by a detailed discussion of each learning goal.

Learning Goal 1: NMT Implementation and Adaptation

NMT Capacity in Adult System of Care. BHRS expanded NMT capacity by training clinicians and supervisors throughout the Adult System of Care. BHRS selected NMT trainees to fill gaps in adult outpatient clinics and programs; however, some providers experienced challenges in getting buy-in for NMT among providers in their clinic or program who were not NMT-certified.

NMT Training Support. BHRS implemented a number of strategies to better prepare and support providers through the intensive NMT training. These improvements helped providers stay motivated and complete the training. However, the training is still time intensive and providers continued to face challenges balancing NMT training with caseload and productivity demands.

Adaptations to Adults. Although NMT assessments took longer and were more complex with adults than children, NMT providers developed effective strategies to adapt the NMT approach to adults. As providers became more confident in the NMT approach and assessment process, providers implemented NMT with a broader adult population.

Provider Skill Development. The NMT training increased providers' knowledge and ability to respond to consumers with a history of trauma. Learning the NMT approach helped providers bring creativity to their work and sharpened providers' clinical skills, which may be encouraging providers to stay at BHRS.

Learning Goal 2: NMT Outcomes

Improved Consumer Functional Domain Scores. Consumers appeared to benefit from NMT services, as indicated by increased functional domain scores. However, the magnitude of change varied widely across consumers, and preliminary data demonstrated greater and more consistent improvement among transition age youth compared to adults.

Improved Consumer Recovery and Experience of Care. NMT appeared to enhance the consumer experience of care and helped consumers progress in their recovery. Prior to NMT, most consumers had only engaged in more traditional approaches to treatment. Consumers appreciated the individualized approach of NMT, the alternative interventions, and working with providers in a new way. For some consumers, the NMT approach made it easier to engage in therapy.

Trauma-Informed Approach to Care. NMT training and implementation supported NMT clinicians—and, in turn, other providers who work with NMT clinicians—to implement a more trauma-informed approach to care with their caseloads and in their clinics overall.



Learning Goal 1: NMT Implementation and Adaptation

The following section describes key successes and challenges in implementing and adapting NMT to the adult population. The section includes discussion of the selection of providers in the adult system of care, NMT training, the NMT assessment process, and NMT interventions.

NMT Provider Selection

As the NMT pilot progressed, BHRS selected providers to fill NMT gaps throughout the Adult System of Care. Both the NMT Phase I and Phase II trainings were voluntary and available to BHRS master’s level clinicians, although staff had to apply to participate in the training. At the beginning of the pilot, BHRS providers were selected largely due to providers’ interest and availability to participate. However, as NMT became more widely implemented within BHRS and providers’ interest in NMT grew, BHRS received a greater volume of applications from providers in both the Adult and Children’s Systems of Care. When selecting providers to participate, BHRS aimed to fill gaps in the system of care and prioritized clinics or programs that did not have any or had only one NMT-certified clinician. This strategy helped ensure there are NMT-trained clinicians throughout the Adult System of Care—including in BHRS clinics as well as residential placements. To continue expanding NMT services and buy-in within the Adult System of Care, BHRS should continue prioritizing training providers at sites or programs where there are no or only one NMT trained clinician.

Providers participated in NMT training to strengthen their ability to serve consumers with a history of trauma. Throughout the evaluation period, 24 ASOC clinicians participated in the Phase I NMT training, and 5 providers participated in the Phase II “Train-the-Trainer” trainings. Providers received information about NMT and the NMT training opportunity from supervisors, team members, and training announcements circulated by BHRS.

There were three people going through training program [at my clinic], and they would come back and share what they were learning and the changes and progress they were making...I also heard NMT referenced through other trainings I was part of. When the opportunity came to do the training myself, I was on board.

– NMT Provider

Most providers shared that prior to the NMT training, they were working with individuals with a history of trauma and wanted to strengthen their abilities to respond to and treat the impact of trauma. Some learned about NMT through the six core principles training and wanted to participate in the training to learn more about the impact of trauma on neurodevelopment. Other providers were already familiar with the NMT approach—either from attending other trainings or conferences where NMT was discussed or working with other NMT-trained clinicians—and were eager to participate in the training themselves.

Providers participating in the Phase II training wanted to deepen their understanding of NMT principles learned in the Phase I training. In some cases, providers completed the Phase I training several years earlier and wanted to refresh and strengthen their training. Others had just completed the Phase I training



and wanted to continue to build upon the foundations and skills learned to strengthen their own abilities as well as educate others on NMT principles.

NMT Training

BHRS created and filled a Mental Health Program Specialist position to support NMT training. As NMT continued to expand within the BHRS systems of care, BHRS developed a Mental Health Program Specialist role in the third year of the pilot. This role was instrumental in supporting the organization and coordination of the NMT program. The Mental Health Program Specialist is a certified NMT clinician and trainer within BHRS and acted as an important resource and mentor for NMT trainees.

BHRS implemented a number of strategies to support providers to stay on track with the intensive NMT training obligations. NMT training requires significant time and dedication. Providers from the first cohort of trainees in the Adult System of Care shared that the training was more demanding and time consuming than expected. Translating NMT tools from the child to adult population also intensified the time spent during training. Additionally, providers noted that the training website was difficult to navigate, posing impediments to accessing the self-study materials.

[My mentor] provides a lot of positive feedback, modeling a lot of what we are learning. She's attentive and doesn't seem to miss a thing which helps me feel more engaged. It's like going through school again, but when you're engaged and you see progress and you see changes in your clients, then it feels worth it.

– NMT Provider

To address some of these challenges, BHRS implemented several strategies throughout the pilot to better support trainees, including:

- 1) **Setting clearer expectations about NMT training demands.** During the training outreach and selection process, BHRS was clear with potential trainees as well as supervisors about the NMT training requirements to help ensure providers and their supervisors better understood the demands prior to beginning the training.
- 2) **Compiling and organizing training materials for providers.** Each month the BHRS' Mental Health Program Specialist for the NMT program created a zip file with all of the self-study materials along with a checklist or instructions for training activities and expectations for that month. Providers shared that these emails helped keep providers organized, motivated, and engaged.
- 3) **Providing greater mentorship throughout the training.** The first cohort of trainees expressed a need for more one-on-one mentorship throughout the training process. For subsequent cohorts, BHRS ensured all trainees were assigned a mentor at the beginning of the training period. Additionally, BHRS implemented the Phase II training to grow the number of NMT-trained providers who could serve as mentors for subsequent cohorts. Mentors worked with trainees on a biweekly or monthly basis (depending on the trainee's needs) to help trainees better understand and integrate NMT principles. This often included reviewing and discussing self-study materials, reviewing cases, and co-leading or supporting trainees during assessments and intervention planning. Many providers shared that the mentorship was the most helpful aspect of the training.



- 4) **Granting trainees compensatory time for NMT training and self-study.** To help ease the burden of participating in NMT training on top of existing work and caseloads, BHRS granted all trainees four hours of compensatory time (i.e., comp time) each week. This time was intended to help trainees set aside time for self-study and other training requirements.
- 5) **Reducing the number of NMT assessments required to complete the NMT training.** With the complexity of adult cases, some providers noted that the Phase I training requirement of 10 completed assessments was too demanding in the adult population as it often took a longer time to conduct assessments with adults. Given this challenge, BHRS worked with CTA to modify the training requirements to allow providers within the adult system of care to complete 7 rather than 10 NMT assessments.
- 6) **Creating flexibility in the training schedule during the COVID-19 pandemic.** The third cohort of Phase I training began in January 2020, and was therefore impacted by COVID-19 and shelter-in-place restrictions. Although the Phase I training was intended to last 12 months, BHRS extended the third cohort's training to 18 months (ending in June 2021) to help alleviate NMT training demands as providers personally coped with the impacts of the pandemic and adjusted to providing services in a remote environment. Although providers noted that the training was still intensive, extending the training helped relieve providers' anxiety about keeping up with training requirements and made the training experience more enjoyable.

Additionally, as NMT was more widely implemented within BHRS, more trainees were exposed to NMT before beginning the formal training by working with other NMT-trained clinicians. In many cases, NMT-trained clinicians conducted assessments with individuals on other non-NMT trained clinicians' caseloads. Some of these non-NMT trained clinicians then opted to participate in the Phase I training, or expressed a desire to participate in the training at a later time, to learn more about NMT and conduct the assessments themselves. Providers' base level of knowledge and familiarity with NMT and the assessment process before starting the training may have better prepared providers in later training cohorts.

Having sufficient time to complete training requirements was a persistent barrier for trainees.

In the first year of NMT training with adult clinicians, only half successfully completed the training. In subsequent cohorts, all ASOC clinicians successfully completed the training, in large part due to the strategies implemented to better support and retain providers throughout the training. Nevertheless, having sufficient time to complete training requirements remained a persistent challenge for providers throughout the pilot period. Some non-NMT trained providers shared that although they were interested in the formal NMT training, they opted not to participate as the time commitment seemed daunting.

Time is a challenge in general, and the productivity index is a pressure as well. Yeah, we can use comp time, but I still need to reach a level of productivity.

– NMT Provider

Although the allocated comp time helped providers meet training requirements, the comp time was not enough at the beginning of the training when providers were familiarizing themselves with the materials and/or were learning NMT principles for the first time. Additionally, the approval of comp time was inconsistent across sites and supervisors, and providers were sometimes unsure of when to use or how



to submit comp time. In particular, Phase II providers shared that they needed time to practice teaching and presenting on NMT modules but were unclear if comp time could be used. Several trainees shared that even with comp time, they still felt pressure to meet productivity targets and ended up needing to work additional hours to keep up with the training. As a result, some providers fell behind on training requirements. Moving forward, BHRS should continue exploring and implementing strategies to help alleviate the time burden of NMT training.

The NMT training increased providers’ knowledge and ability to respond to consumers with a history of trauma. Overall, providers found the NMT training useful and interesting and enjoyed learning about the neurobiology and impact of trauma. For many of the providers, the NMT training provided an opportunity for more advanced training in brain development and neuropsychology related to trauma. For Phase I trainees in particular, their increased knowledge and understanding about the impact of trauma helped them better understand the behaviors and presentation of consumers. For Phase II trainees, the training helped them understand NMT principles more deeply. Phase II providers improved their ability to identify and integrate appropriate interventions (particularly the use of sensory tools) into therapy, as well as apply and explain NMT principles to consumers and other providers.

Learning the NMT approach helped some providers bring creativity to their clinical work, which may also support provider retention at BHRS. NMT enabled providers to “think outside the box” when identifying interventions to best meet each consumer’s unique needs. In some cases, providers shared that the ability to be creative in their clinical work as a result of NMT helped keep them at BHRS. NMT trainers and supervisors also observed these changes among providers and noted that the training sharpened providers’ clinical skills. Given these benefits, several providers shared that all clinicians should receive some training in the NMT principles and the impact of trauma on neurodevelopment in order to improve service delivery to the entire adult consumer population.

NMT Assessment Process

Providers implemented strategies to streamline the assessment process. The NMT assessment process is fairly intensive and includes a number of detailed questions to understand a consumer’s developmental history and past experiences of trauma. For all new NMT trainees—in both adult and youth systems of care—it takes time for providers to learn and gain comfort with the assessment tool. Providers in adult systems typically had a steeper learning curve as they do not regularly conduct developmental histories with adult consumers with the level of detail required for the NMT assessment.

At first, I tried to run the NMT assessment like a regular BHRS assessment, and I realized some of the questions are really intense for adults that are going through a lot of trauma. Now, I give clients lots of space to talk, and I don’t put a limit on the number of sessions to complete the assessment. My mentor has given me many tips on how to go through the assessment.

– NMT Provider

As NMT trainees first learned the assessment questions and process, they often administered the assessment in a direct way, going question by question. This approach took longer and risked re-traumatizing consumers—particularly adults—who were not



accustomed to these types of questions. As providers progressed through the training and became more confident with the assessment tool, they typically learned and implemented strategies to make the assessment process smoother and minimize the risk of re-traumatization. These strategies included:

- 1) **Explaining the process and providing some psychoeducation to consumers** to help consumers understand why the providers are asking about their childhood and adolescence;
- 2) **Asking broader questions or combining questions** to make the assessment more conversational, less burdensome, and less-time consuming as well as to reduce the risk of re-traumatization;
- 3) **Breaking up the assessment over multiple visits** if the consumer had reactions to the questions or struggled to focus long enough to complete the assessment;
- 4) **Reaching out to additional respondents who may have information about the consumer**, such as another provider who is familiar with the consumer's history;
- 5) **Examining existing health records** for clients who have been open to BHRS to learn more about the consumer's history; and
- 6) **Closing an assessment session with mindfulness exercises, meditation, or other interventions** to help soothe or stabilize consumers after discussing difficult topics.

Mentors also helped shorten the assessment learning curve and helped trainees learn and implement some of the strategies more quickly. In addition to discussing the assessment process with trainees, mentors also often conducted the first assessments with trainees. During these co-assessments, mentors modeled these strategies or gave feedback to trainees about how to make the assessment process easier.

During shelter-in-place, NMT providers transitioned to conducting assessments over the phone or through video conferencing. Providers found that some consumers were more difficult to engage through remote services due to technology limitations or unreliable access to phones. Other consumers—particularly TAY—were uncomfortable with telehealth services and had anxiety about talking over the phone or through video conferencing. Some parents had less time or less privacy to participate in NMT sessions due to family obligations. Rather than spending an hour and a half with consumers, some consumers were only able to engage with providers for 15 or 30 minutes at a time. Additionally, BHRS providers initially had more difficulty accessing electronic health records through their home laptops to gather historical information. Given these limitations, several providers found it particularly important to pace the assessment questions and implement strategies to ease the assessment process on consumers.

On the other hand, some providers found it easier to engage other consumers through remote services. In some cases, consumers found it difficult to sit still or engage in services in an office environment. However, when talking over the phone, consumers were free to walk around which helped them stay engaged and better communicate. In other cases, providers had more access to family members who could provide historical information during the assessment process.

Assessments were more time consuming and challenging to complete with the adult population compared to children. Although providers implemented different strategies to make the assessment process less burdensome, implementing NMT assessments was more time consuming and challenging with adults than with children. Some reasons the assessment process was often longer for adults were:



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- With adults, the NMT assessment collects information for a consumers’ entire developmental history—fetal stages through adulthood. In contrast, the assessment is shorter for children as it only collects information through the child’s current developmental stage.
- The assessments can be more time consuming for adults if consumers cannot recall information, and/or if consumers need to take breaks or stop the assessment if it brings up difficult experiences.
- Compared to children, adult consumers may have fewer collateral contacts that the providers or consumers can work with in order to fill in information gaps of the assessment.
- Adult consumers may be less likely to regularly participate in NMT services due to the severity of mental illness, substance use, homelessness, incarceration, or other barriers to consistently accessing or engaging in services.

Given these challenges, providers experienced difficulty completing assessments when consumers stopped regularly attending mental health service appointments or were incarcerated, hospitalized, or otherwise unavailable to continue. Although completing the assessments was a challenge for many providers throughout the NMT adult pilot, NMT providers began implementing the NMT approach with consumers before the assessment was completed. Providers found that implementing NMT interventions helped some

consumers better understand the NMT approach and built buy-in for continuing the assessment process. For some consumers, engaging in NMT interventions also helped consumers feel more comfortable sharing information, which helped facilitate the assessment process.

Providers expanded NMT selection criteria to include consumers with greater mental health needs. In the earlier stages of NMT training, providers were often conservative in determining which consumers to refer to NMT. Providers were mindful of the risk of the assessment process and effectiveness of interventions based upon consumers’ level of functioning, coping skills, and ability to self-regulate as well as providers’ experience with the assessment tool. At the beginning of the pilot, several providers mentioned that they typically only referred higher functioning consumers.

As providers gained more experience and confidence with NMT and the assessment process, providers’ perception of the adult population that could benefit from NMT evolved, and providers’ selection criteria expanded. Providers still considered the risks of engaging in the assessment with the potential benefits of NMT and strove to build rapport with consumers before beginning the assessment process. However, providers noted the most important selection criteria for NMT are:

- Consumer has a history of trauma;
- Consumer is willing to participate in NMT and regularly attends appointments; and
- Consumer is stable enough to recall information and provide realistic responses.

It is easier to complete an NMT metric with children than adults. It’s geared toward kids and it’s a much shorter history. They take a lot more time to do with adults and it’s definitely an investment, 3-4 sessions for an assessment at least.

– NMT Provider



Throughout the pilot, NMT providers also began to see the potential for NMT among consumers where more traditional approaches to treatment had not worked. Providers saw NMT as an opportunity to try something different. As NMT expanded throughout the BHRS System of Care as implementation of the NMT pilot progressed, providers also identified other populations that could benefit from NMT—such as parents of children in the youth system of care, mothers who were experiencing post-partum depression, and individuals with more severe mental health needs who were receiving treatment at residential placements.

Those that are actively psychotic are really difficult to do in person. It's not as linear or black and white, but you can often get answers just being with them and building rapport. You can also provide what you think the NMT intervention is first, rather than waiting for the assessment to be complete.

– NMT Provider

Providers shared that it was most challenging to conduct assessments with individuals who were actively abusing substances, were experiencing psychosis, or had developmental disabilities. These factors influenced consumers' ability or willingness to respond to assessment questions and/or regularly participate in NMT services. However, if it was apparent that the individual could benefit from NMT services, providers implemented the NMT approach and interventions with these clients even if a formal assessment could not be completed.

NMT Interventions

Throughout the pilot, BHRS expanded the NMT resources and interventions available to consumers in the Adult System of Care. At the beginning of the NMT adult pilot, the resources for NMT interventions was somewhat limited. Providers noted that many children's clinics already had tools and resources that could be used for NMT interventions, such as weighted blankets or sensory tools. In comparison, the Adult System of Care is more heavily focused on medication management and talk therapy. As a result, adult providers initially had less access to tools and resources for NMT interventions.

Throughout the pilot period, BHRS focused efforts on expanding resources and establishing new interventions—such as YMCA memberships, animal-assisted therapy, therapeutic massage, and the “Art of Yoga” therapeutic yoga sessions for NMT consumers. All NMT providers were also equipped with a basket of sensory tools (e.g., fidget spinners, stress balls, play doh, sensory brushes, pipe cleaners, etc.) to keep in their office for consumers to use. In addition to these tools, BHRS allowed BHRS providers to request specific resources or interventions to best meet their clients' needs (e.g., rocking chair, weighted blankets, coloring books, sketch pads, etc.). Beyond providing resources directly for interventions, NMT providers also received training in implementing sensory profiles to better understand consumers' sensory preferences and behaviors. This information was used to further inform appropriate therapeutic strategies and interventions.



Providers tailored NMT interventions to each consumer’s specific interests and needs.

The assessment recommendations serve to guide the types of interventions that consumers may need and that providers should prioritize. However, the specific interventions that providers selected were tailored to what each individual was interested in and willing to do. As mentioned, compared to the Youth System of Care, the Adult System of Care is more heavily focused on medication management and talk therapy. As a result, adults were typically unaccustomed to participating in the types of alternative interventions recommended by NMT. Providers found that compared to children, some adults were less willing to try new and different types of activities.

[My provider] has a box of squishy things, as well as a sand tray. [The interventions] offer a different way to express yourself, rather than talking it out.

– NMT Consumer

Providers aimed to learn about consumers’ hobbies and interests and suggested activities that aligned with the recommended interventions but that may also be more familiar—such as deep breathing, counting, going for walks, and mindfulness exercises. Providers observed that the sensory tool baskets also served as a conversation starter and were a good mechanism to communicate NMT principles. As providers built rapport with consumers and learned more about consumers’ specific goals and needs, providers suggested new or additional activities that consumers might enjoy or benefit from—such as yoga, massage therapy, animal assisted therapy, drumming, or spinning clay. In some cases, providers also engaged in these activities alongside consumers, which helped develop trust with the NMT provider as well as built buy-in for the interventions.

Providers also encouraged consumers to suggest new activities that consumers wanted to try—including building models, calligraphy, or using essential oils. Consumers appreciated having a variety of activities to choose from and tools to use to best meet their needs in different situations. This flexible and individualized approach helped consumers feel supported and engaged, and increased the likelihood that they would implement the interventions independently.

During shelter-in-place, providers identified strategies to adapt NMT interventions to a remote environment. During shelter-in-place, providers identified interventions that consumers could implement and work on in their own living environments. In some cases, providers mailed or dropped off tools or resources—such as sensory tools, weighted blankets, yoga mats, coloring books, etc.—at consumers’ homes. During video sessions, NMT providers found ways to engage in interventions with consumers—such as each going for a walk while they were together on the phone, coaching consumers through an activity like gardening or molding clay, or watching YouTube videos together.

Nevertheless, as described previously, providers also found it challenging to engage some consumers. For individuals who were uncomfortable with telehealth or video conferencing, providers began by engaging consumers in 10-15 minute sessions and gradually built up to longer meetings. Some providers also began NMT sessions the same way each time (e.g., practicing the same bilateral movements) to help ground consumers in the session and what they were doing together. Other consumers did not have access to video conferencing technology. Although providers were still able to engage some consumers over the



phone, they noted it was more challenging to work with some consumers—particularly TAY who were often less communicative—without being able to see their reactions or body language. For consumers without reliable access to phones, it was particularly challenging to participate in virtual services. Some consumers also mentioned they missed the in-person interaction, and suggested it would be helpful to meet with providers in outdoor spaces (wearing masks and practicing social distancing) when possible.

Support and resources from BHRS helped providers implement the various NMT interventions.

Some providers shared that prior to the NMT pilot, they were used to purchasing materials or tools for their offices out-of-pocket. With the NMT pilot, providers were able to request tools and resources for the NMT interventions through County funds, which helped providers expand the interventions available to better meet each consumer’s unique interests and needs. Nevertheless, some providers noted that insufficient space or poor office configuration was a constraint for effectively implementing some NMT interventions. Some providers noted that it was challenging to find instructors or providers to lead some group NMT interventions—such as yoga or gardening—due to providers’ workload constraints. Additionally, some providers were unsure what types of tools and resources they could request and provide to NMT consumers during shelter-in-place.

We have funds to support NMT interventions, like getting a rocking chair for one of our clients. This is the first time I’ve gotten supplies with County support.

– NMT Provider

Learning Goal 2: NMT Outcomes

The following section describes individual-level outcomes of adult consumers who participated in NMT services—including changes in assessment scores and recovery outcomes—as well as larger systems-level changes in providers’ approach to care as a result of NMT implementation in the adult system.

Changes in Brain Map and Functional Domain Scores

At the time of this report, follow-up assessment data were available for 46 consumers (51%). Providers conducted follow-up NMT assessments with consumers to evaluate consumers’ progress as well as update consumers’ treatment plans if necessary. On average, there were 12 months between the baseline and most recent follow-up assessments, although the time interval ranged from 4 months to nearly 2.5 years.

Among consumers with follow-up assessments, 24 were adults (52%) and 22 were TAY (48%). Additionally, 13 consumers (28%) were part of the reentry population, all of whom were adults. The evaluation examined changes in assessment scores overall as well as across sub-populations—including a comparison of adults to TAY, and a comparison of reentry and non-reentry adults. However, given the small number of individuals with follow-up data available, assessment findings should be considered exploratory.

The relatively small number of individuals with follow-up assessments and the varying length of time between assessments may partially reflect the challenges in completing assessments and inconsistent participation in services among the adult population. In some cases, programs are designed to be short-



term and consumers may graduate or move on to other services before a follow-up assessment is completed.

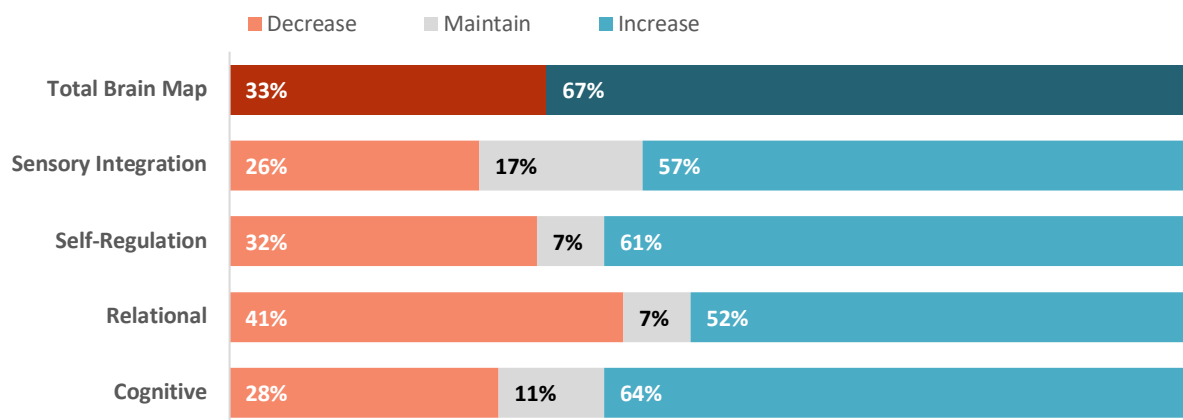
For the 46 consumers with follow-up data available for this report, baseline and follow-up assessment data were examined to identify changes in consumers’ brain map and functional domain scores as consumers participated in NMT services. Brain map and functional domain changes are defined as follows:

- **Increase:** any positive change in a score from baseline to follow-up (follow-up – baseline > 0),
- **Decrease:** any negative change in scores from baseline to follow-up (follow-up – baseline < 0).
- **Maintain:** no change in the score from baseline to follow-up (follow-up – baseline = 0)

Increases in brain map values suggest improvement (progress toward age typical functioning), while decreases in brain map values suggest further impairment (movement away from age typical functioning).

Although the magnitude of change varies, approximately two-thirds of consumers showed increases in their assessment scores, suggesting functional improvements. As shown in Figure 9, 67% of consumers (n=31) showed increases in their total brain map scores, while 33% (n=15) showed a decrease.⁹ Across the self-regulation and cognitive domains, approximately two-thirds of consumers showed increases in domain scores and one-quarter to one-third showed decreased scores. Fewer consumers—slightly more than half—showed increases in the sensory integration and relational domains. A quarter of consumers showed decreased sensory integration scores while 41% showed decreased relational scores. Across the self-regulation, relational, and cognitive domains, roughly 10% of consumers showed no change in scores. A larger proportion, 17%, showed no change in their sensory integration scores.

Figure 9. Percentage of Consumers with Increased and Decreased Assessment Scores from Baseline to Follow-up, N=46



Overall, the average change in consumers’ brain map was +3%, while the average change in functional domain values was +2% to +5% depending on the specific domain (Table 3).

⁹Although consumers may not have showed changes in one or more of the functional domain scores from baseline to follow-up (i.e., scores were maintained), all consumers showed some change (i.e., increase or decrease) in their overall brain map scores.



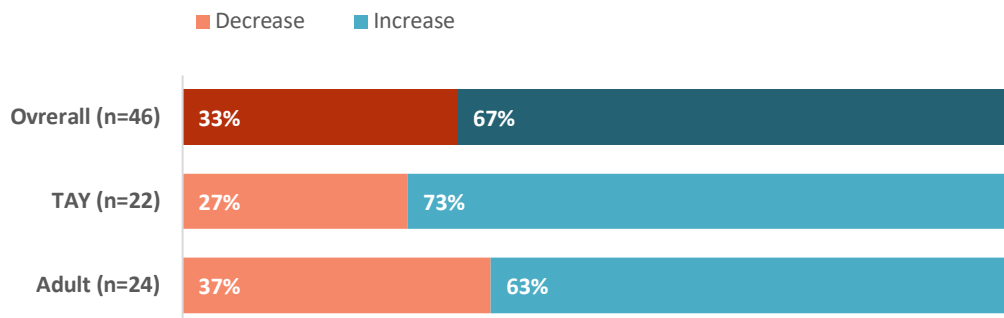
Table 3. Average Change in Assessment Scores from Baseline to Follow-Up, N=46

	Average Change in Scores	Range of Change in Scores
Total Brain Map	+3%	-13% to +25%
Sensory Integration	+3%	-10% to +25%
Self-Regulation	+5%	-11% to +30%
Relational	+4%	-14% to +30%
Cognitive	+2%	-26% to +25%

Providers noted that consumers who had large increases in assessment scores responded particularly well to the selected NMT interventions and consistently engaged in NMT services. These consumers regularly engaged in the recommended activities and/or practiced various self-soothing or calming techniques on a day-to-day basis. However, in other cases, providers noted that some consumers showed great progress in their recovery, but the change in assessment scores was minor. In contrast, providers noted that individuals who showed decreases in assessment scores tended not to engage regularly in NMT services and may have had more active substance use and/or psychosis. Additionally, providers noted that many consumers experienced increased anxiety and isolation during the COVID-19 pandemic, which contributed to decreases in brain map and functional domain scores.

Compared to adults, TAY generally showed greater and more consistent improvement in functional domain scores from baseline to follow-up. As mentioned, differences in the change in functional domain scores were examined across sub-populations. Overall, there were no significant differences between adults who were and were not part of the reentry population, and changes in brain map and functional domain scores were similar. Although there also were no statistically significant differences between TAY and the adult population, TAY tended to show greater improvements in brain map and functional domain scores.¹⁰ As shown in Figure 10, 73% of TAY showed increases in their overall brain map scores compared to 63% of adults.

Figure 10. Percentage of Adults and TAY with Increased and Decreased Brain Map Scores from Baseline to Follow-up, N=46



On average, the magnitude of change in assessment scores also tended to be larger among TAY. Among TAY, brain map scores increased by an average of 5%, while brain map scores increased by an average of

¹⁰ Additional data regarding changes in functional domain scores across subpopulations is available in Appendix II.



2% among adults. These trends continued across each of the functional domains, wherein a greater proportion of TAY had increased scores and the change in scores was larger compared to adults. The larger and more consistent increases among TAY may reflect greater neuroplasticity among TAY compared to adults as they are still undergoing brain development. Additionally, TAY were less likely to have co-occurring substance use disorders and/or psychotic disorders. TAY also tend to have fewer years of heavy psychiatric medication. All of these factors may help TAY more consistently engage in and be more responsive to NMT interventions compared to adults.

Table 4. Average Change in Functional Domain Scores among Adults and TAY (N=28)

Functional Domain	Adult (N=24)	TAY (N=22)
	Average Change (Range)	Average Change (Range)
Total Brain Map	2% (-13 to +23%)	5% (-9 to +25%)
Sensory Integration	3% (-7 to +25%)	3% (-10 to +22%)
Self-Regulation	3% (-11 to +28%)	6% (-8 to +30%)
Relational	3% (-14 to +30%)	5% (-9 to +30%)
Cognitive	0% (-26 to +13%)	4% (-9 to +25%)

No significant differences were found across groups using t-test.

In previous years, the change in brain map and functional domain values among TAY was larger compared to TAY who had their follow-up assessment during FY19-20. Between FY16-17 to FY18-19, TAY showed an average change of +9% in brain map scores. However, when including the most recent follow-up assessments conducted during FY19-20, the average change in total brain map scores was only +5%.

In part, the smaller increase in brain map scores during FY19-20 among TAY may reflect changes in service engagement as well as increased stress and anxiety during the COVID-19 pandemic. Among the 22 TAY with follow-up assessments, 73% (n=16) had their most recent follow-up assessment conducted during shelter-in-place (i.e., after March 15, 2020). Additionally, all TAY that showed decreases in brain map scores (n=6) had their follow-up assessment during shelter-in-place. In comparison, 33% of adults (n=8) had their most recent follow-up assessment conducted during shelter-in-place, nearly all of whom showed improvements in brain map or functional domain scores.

In alignment with these findings, providers observed greater decompensation among TAY during shelter-in-place. As mentioned previously, some TAY had more difficulty engaging and communicating in remote services during shelter-in-place due to anxiety around talking on the phone or over video. Additionally, providers reported that TAY were feeling more isolated without school or other activities and the stress of the pandemic strained family relationships in some households. Half of TAY (n=8, 50%) who completed follow-up assessments during shelter-in-place showed decreases in relational scores compared to only one TAY (17%) who completed a follow-up assessment before shelter-in-place.

Providers noted that many adults also struggled with increased anxiety and isolation during shelter-in-place as well. However, most adults who completed assessments during shelter-in-place showed improvements in functional domain scores. While some adults were also more challenging to engage in remote services, adults who completed assessments during shelter-in-place may have been higher



functioning and/or more willing and able to participate in telehealth compared to those who did not complete assessments during shelter-in-place. As a result, adult consumers' who were high functioning enough to complete assessments during shelter-in-place may have been more likely to improve or maintain scores. Additionally, given TAY experience more neuroplasticity than adults, TAY may be more receptive to changes in their environment—both positive and negative—which may be reflected by greater changes in functional domain scores. Moving forward, BHRS may wish to continue examining differences between TAY and adults in order to tailor intervention strategies for each population.

Changes in functional scores may also be reflective of providers' as well as consumers' increasing experience and comfort with NMT and the assessment process. Providers observed that consumers were forthcoming about their history or experiences as they built rapport with providers and began to see the benefits of NMT. As a result, more accurate information was often available for follow-up assessments, which may have changed assessment scores. In some cases, individuals shared information that resulted in lower assessment scores. Additionally, providers generally completed baseline assessments earlier in their NMT training, whereas follow-up assessments were completed later when providers had more practice and training. As providers gained more experience with the assessments, they sometimes scored criteria slightly differently. For example, some providers noted that when they were first learning the tool, they were more likely score a given criterion neutrally. However, as they became more comfortable with the tool and/or they learned more about the consumer, they were able to score criteria more accurately—which resulted in a higher or lower score.

NMT Consumer Recovery and Experience of Care

NMT helped some consumers progress in their recovery.

Aside from changes in assessment scores, all focus group participants (including providers and consumers) pointed to benefits consumers experienced as a result of participating in NMT interventions. Consumers frequently discussed how the NMT interventions helped them feel less anxious, more relaxed, and more in control. Concentrating on an activity—such as coloring or origami—helped consumers “get out of their head,” while techniques such as deep breathing, meditation, yoga, or the use of sensory tools helped consumers stay centered and calm. As one consumer shared, “If there’s something on my mind and I do origami, my focus is on the origami. After I’m done with the origami, the stuff I was worried about isn’t too much to worry about anymore.”

Evaluating situations and making better choices has been a significant improvement. Now I think about options to handle a situation, rather than just reacting to a negative stimulus. Now, I also think about the association of things. I think I would have handled issues with my family differently before. Now I have empathy and think about how they got to be that way.

– NMT Consumer

In several cases, consumers felt NMT helped improve their quality of life and shared that they had a renewed interest in hobbies, reaching their goals, and spending time with family or friends. Other changes noted by consumers and providers included better communication, improved ability to manage emotions or stress, and being better equipped to recognize and manage triggers. Other consumers reported that



the NMT-based techniques and activities helped consumers decrease substance use as well as reduce or avoid medication to cope with depression and anxiety.

For some consumers, the assessment process and NMT interventions helped them process their experiences to develop better insight and understand the impact that trauma had on their current behaviors as well as behaviors of others. Consumers talked about how the interventions created a safe space for them to address and rewrite their history. Providers also shared that some consumers began to use NMT and trauma-informed language when discussing their experiences and recovery.

NMT offers an alternative approach to treatment that many consumers had never experienced. For some consumers, the NMT approach made it easier for consumers to engage in therapy. Consumers shared that NMT felt different from other mental health services they had received. In many cases, consumers were accustomed to more traditional talk therapy, which

[NMT interventions] like the sand tray, or sketching, or writing offer a different way to express yourself, rather than talking it out.

– NMT Consumer

often left them feeling emotional and fatigued after sessions. In other cases, consumers talked about how other services they had received felt “one size fits all” and that previous providers did not try to get to know or understand them as individuals. Some consumers also felt that other providers were more focused on identifying a diagnosis and the appropriate medication. In contrast, the individualized approach of NMT helped consumers feel respected and heard. One consumer shared,

“[My NMT provider] and I were able to develop a relationship where we could talk. We realized that even though we had philosophical differences we respected each other. [My NMT provider] took time to understand where I was coming from. Others in the past were in a rush to make an opinion or put down a diagnosis. Whereas [my NMT provider] would ask if I thought it was the correct assessment and would allow me to make clarifications. I knew he was paying attention because he would ask questions based on what I said. I appreciated that.”

Several consumers observed that it was easier for them to discuss their feelings and trauma when engaging in the activities and that it helped them feel safe. Several consumers described feeling “refreshed” or “light” after NMT activities. Consumers appreciated that providers tailored activities to consumers’ specific interests, and providers’ willingness to participate in the activities with consumers helped build rapport and trust.

“I’ve worked with [my NMT provider] longer than anyone else in the past. Past therapists would try to diagnose me, and then give me some form of medication to ‘treat’ me. I don’t think that actually addressed any of my issues... I’ve never had a therapist that’s like let’s do yoga, I’ll do it with you. Let’s do meditation, or this Qigong video together. Sometimes we do sit down and have a serious conversation. But I think developing a bond through doing activities like yoga made me feel more comfortable. [My NMT provider] is very relatable.”



Several consumers mentioned that no other providers had worked with them in this way before and that with NMT they look forward to their next sessions. As mentioned previously, in several cases, NMT consumers also implement NMT interventions on their own in between sessions.

Provider Approach to Care

NMT implementation helped some clinics and programs be more trauma-informed. As mentioned, providers reported that being trained in NMT and the neurodevelopmental impacts of trauma changed the way they approach care with all consumers. Additionally, providing NMT services in the Adult System of Care appeared to support non-NMT providers to employ a more trauma-informed approach when working with both NMT and non-NMT clients.

Since I've been in a leadership role [at my clinic], NMT has been a constant part of agenda. At least once a month, I'm presenting on something on NMT and trauma-informed care...We want to get to a point where [non-NMT trained] supervisors can tell when a person needs a metric.

– NMT Provider

Non-NMT trained providers shared that the NMT assessment process can provide more comprehensive information about a consumers' history than they might have otherwise obtained. The assessment also helped non-NMT providers to identify and implement other types of interventions that the consumer may respond well to. Non-NMT providers shared that the assessment process helped them better understand consumers, and in some cases they were able to work with consumers or their families differently. For example, NMT-trained clinicians conducted NMT metrics and identified sensory interventions with consumers in residential placements, which helped non-NMT providers better understand consumers' behaviors and triggers. Additionally, the NMT clinicians offered recommendations for therapeutic strategies or interventions that the non-NMT providers could implement that were effective with the clients—such as walking, using a glider chair, or engaging in breathing exercises. Providers also noted that some psychiatrists began implementing or requesting NMT interventions, marking a shift to try behavioral interventions rather than medication alone.

Throughout the pilot, non-NMT providers increasingly requested NMT assessments for consumers on their caseloads, including adult consumers as well as parents of youth consumers. Non-NMT providers shared that they typically requested an assessment when they knew the individual had a history of trauma and other interventions were not working. One provider stated they requested an assessment when “you realize we need to be doing something different with the consumer, but we aren't sure what.” Non-NMT providers then worked with the NMT-clinician during the assessment process, providing background information to the NMT provider, helping explain the process to the consumer, as well as being present during the assessment to help the consumer feel more at ease.



Additionally, as the NMT adult pilot progressed, BHRS received a greater volume of requests for the core principles training throughout the Adult System of Care. Providers who participated in the core principles training found it helpful to begin to understand NMT and how to take a more trauma-informed approach to care. Although some providers shared that they did not intend to get certified in NMT due to the intensive training demands, they also felt that all providers should participate in the six core principles training to

better understand the impact of trauma on individuals' behavior—including both consumers and caretakers. BHRS is also working with some non-NMT trained providers to adapt the core principles training to non-clinical providers and environments that still work closely with consumers, such as board and care facilities.

NMT clinicians mentioned that other providers within their clinics or programs were not always open or receptive to NMT, but having a supportive supervisor or more than one NMT-trained clinician made it easier for providers to implement NMT. In some cases, NMT providers worked on interdisciplinary teams or with non-BHRS providers who did not have as much training in trauma-informed approaches and were more dismissive of NMT. Providers also observed that non-NMT clinicians who worked in the mental health system for a long time may have seen NMT as an intervention that will “come and go”.

Other non-NMT trained saw the utility in the NMT approach, but felt the NMT assessment was too time intensive, and were unsure whether the assessment yielded practical information. Some non-NMT trained providers who participated or requested an assessment were surprised by the lack of depth in the assessment results and had hoped for more specific interventions and recommendations given the extensiveness of the assessment process. However, non-NMT providers who worked with other NMT trainers or mentors (rather than NMT trainees) appeared to have clearer expectations and a better understanding of how to interpret and use the NMT assessment output to inform interventions.

Non-NMT providers also questioned how well the NMT assessment questions translate across different cultures and socioeconomic backgrounds. Others felt that NMT interventions were not as effective if factors in the consumers' home environment could not be changed. In particular, non-NMT providers noted that oftentimes parents have experienced their own trauma that needs to be addressed before they can better support their child. In some cases, providers did not realize that NMT assessments and interventions could be conducted with parents or caretakers, or shared that billing structures made it

Board and Care operators are the caregivers, and so how they're interacting with the client is so important. I'm trying to keep interventions in line with the six core strengths, it's nothing fancy. But, none of operators are mental health providers, they have high school education, and they tend to see behavior as very volitional. Providing them an alternative rationale to what's going on and different ways to intervene are helpful.

– Non-NMT Provider

The NMT questionnaires were so lengthy. We really went through it all with the family because we wanted them to have all the information they could. But when the report came back, I was like wow that's it. My expectations were for something more groundbreaking.

– Non-NMT Provider



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difficult to provide interventions to the parents or caretaker. Moving forward, it may be important to set clearer expectations with non-NMT providers about the NMT assessment process—including information the NMT assessment can provide and how it can be used. Additionally, some non-NMT providers suggested that to increase buy-in for the NMT approach, NMT providers may be able recommend interventions without first conducting the full NMT assessment.

Having a supervisor who is trained in or supportive of NMT made it easier for NMT providers to implement NMT more widely within a clinic or program. During case conferencing, supervisors could recommend that a consumer on a non-NMT provider's caseload receive an NMT assessment based upon the consumer's presentation and history of trauma. In contrast, NMT clinicians in non-supervisory roles and/or in larger teams felt they had less authority to suggest NMT to their fellow colleagues. NMT providers are hopeful that with the increasing exposure to NMT in the Adult System of Care, more providers will be receptive to and request NMT for their clients.



Conclusion

In 2016, BHRS implemented the NMT adult pilot with the aim of providing alternative treatment options to broaden and deepen the focus on trauma-informed care and provide better outcomes in recovery for adult BHRS consumers. Over the course of the four-year NMT adult pilot, BHRS achieved these goals.

During the NMT adult pilot project, a total of 29 providers in the BHRS Adult System of Care participated in NMT training—including 12 providers who completed the Phase I NMT certification, 6 trainees who were still participating in NMT certification as of the end of the pilot period, and 5 providers who completed Phase II “NMT Train-the-Trainer” training to become certified mentors and trainers. Providers were intentionally selected to fill gaps in NMT services across adult clinics and programs. **As more providers were trained in NMT across BHRS adult programs, the volume of adult consumers receiving NMT services steadily grew from 20 consumers in Year 1 to 90 consumers by Year 4.**

Throughout the pilot project, BHRS continually built upon lessons learned to effectively adapt the NMT approach to adults and an adult system of care. For some providers, learning NMT principles and interventions was challenging and represented a shift from the more traditional adult treatment model of medication management and talk therapy. BHRS implemented a number of strategies to better support providers throughout the intensive NMT training. In particular, greater one-on-one mentorship throughout the training process was instrumental in supporting providers to learn NMT principles, streamline the assessment process, and adapt the approach to an adult population. Additionally, BHRS continued to better equip clinics and programs with NMT resources to expand the NMT interventions available to adult consumers, enabling providers to tailor NMT interventions to adult consumers’ specific interests and needs.

The NMT adult pilot also demonstrated that adult consumers can benefit from the NMT approach. Consumers who participated in NMT progressed in their recovery, and for some, the NMT approach may have made it easier for consumers to engage in therapy. For many consumers, the NMT approach was the first time that providers had implemented strategies other than talk therapy or medication. Consumers appreciated the individualized approach of NMT, and both consumers and providers cited improvements in consumers’ coping mechanisms and overall quality of life as a result of NMT interventions. Although follow-up assessment data were somewhat limited, data suggest that consumers who participated in NMT improved across all functional domains. TAY appeared to respond particularly well to NMT and showed greater and more consistent improvements in functional domain scores compared to adults. This may reflect the greater neuroplasticity of TAY compared to adults. However, among all age groups, providers noted that consumers who engaged in NMT interventions more regularly tended to show the greatest improvements.

NMT implementation also strengthened BHRS providers’ ability to serve consumers with a history of trauma. As more providers were trained in NMT, worked with NMT-trained clinicians, and/or were exposed to principles of NMT and trauma-informed care, the NMT pilot supported the adoption of trauma-informed practices and treatment options in the BHRS Adult System of Care overall.



NMT Program and Funding Continuation

San Mateo County BHRS presented interim NMT outcomes to stakeholders, the MHSA Steering Committee, and the Mental Health Substance Abuse Recovery Commission (MHSARC) in 2019. During this meeting, BHRS provided an update on progress toward program learning goals, implementation milestones and accomplishments, client outcomes and improved mental health indicators, and a proposed sustainability plan. The sustainability plan included leveraging the train-the-trainer model implemented during the project period as well as request of \$200,000 ongoing MHSA funds, beginning in FY 2020-21 to support a 0.3 FTE Mental Health Specialist to oversee the project, training maintenance and increased interventions for clients. An estimated 30 members of the public attended the presentation and had the opportunity to ask questions and provide public comment.

In a subsequent meeting, the MHSA Steering Committee made a motion to approve a one-year no cost extension of NMT for FY 2019-20. Additionally, the idea to fund NMT using MHSA one-time unspent funds as an interim solution was presented at this meeting, with the intention to incorporate the ongoing project sustainability into the FY 2020-23 MHSA Three-Year Plan Community Program Planning process. The Plan to Spend was developed in collaboration with stakeholders during two MHSA Steering Committee meetings and input sessions with the MHSARC Older Adult, Adult, and Youth Committees, as well as the Contractor's Association, the Office of Consumer and Family Affairs/Lived Experience Workgroup and the Peer Recovery Collaborative.

In October 2019, the MHSA Steering Committee reviewed the draft Plan to Spend and provided comments. In November, the MHSARC held a public hearing, closed the 30-day public comment period, reviewed the public comments, and subsequently voted to submit the plan to the Board of Supervisors for approval. The final Plan to Spend was submitted and approved by our Board of Supervisors in April 2020.

During the FY 2020-23 MHSA Three-Year Plan Community Program Planning process, the COVID-19 pandemic transpired. Given the significant revenue decrease projections expected due to the pandemic, it is unlikely that San Mateo County will be able to fund any new programs or expansions, including NMT, past FY 2021-22. At the MHSA Steering Committee in February 2021, BHRS will work with stakeholders on a plan to utilize reserves for possible sustainability of this and other programs. BHRS also plans on addressing ongoing sustainability of NMT and other programs past FY2022-23 again during the next MHSA Three-Year Plan Community Program Planning process scheduled to begin in the fall of 2022.

As mentioned above, preliminary project outcomes were presented to stakeholders, the MHSA Steering Committee and the MHSARC in 2019. The final report will be presented to these same groups in May 2021 as part of the FY 2020-21 MHSA Annual Update, posted on the San Mateo County MHSA website, BHRS blog and disseminated to the over 2,000 local MHSA subscribers. There are no current plans to present to other counties but BHRS is open to this possibility.



Appendix I. Baseline NMT Assessments Across Target Populations

Adults compared to TAY

Table 5. Average Baseline Functional Domain Scores among Adults and TAY (N=82)

Functional Domain	Adult (N=55)	TAY (N=27)
	Average Score (Range)	Average Score (Range)
Total Brain Map	76% (29 to 96%)	78% (53 to 99%)
Sensory Integration	82% (38 to 100%)	80% (51 to 100%)
Self-Regulation	70% (34 to 94%)	74% (45 to 100%)
Relational	70% (27 to 96%)	74% (49 to 100%)
Cognitive	82% (15 to 100%)	80% (62 to 99%)

No significant differences were found across groups using t-test.

Table 6. Baseline Recommended Intervention Level among Adults and TAY (N=82)

Functional Domain	Recommended Intervention Level	Adult (N=55)	TAY (N=27)
		% of Consumers	% of Consumers
Sensory Integration	Essential	15%	7%
	Therapeutic	38%	59%
	Enrichment	47%	33%
Self-Regulation	Essential	38%	26%
	Therapeutic	38%	56%
	Enrichment	24%	19%
Relational	Essential	42%	22%
	Therapeutic	35%	56%
	Enrichment	24%	22%
Cognitive	Essential	9%	11%
	Therapeutic	31%	33%
	Enrichment	60%	56%

No significant differences were found across groups using chi-square test.



Non-Reentry compared to Reentry Adults

Table 7. Average Baseline Functional Domain Scores among Non-Reentry and Reentry Adults (N=55)

Functional Domain	Adult: Non-Reentry (N=27) Average Score (Range)	Adult: Reentry (N=28) Average Score (Range)
Total Brain Map	74% (40 to 96%)	78% (29 to 96%)
Sensory Integration	79% (53 to 100%)	85% (38 to 100%)
Self-Regulation	66% (35 to 94%)	73% (35 to 94%)
Relational	69% (36 to 96%)	71% (27 to 93%)
Cognitive	82% (22 to 97%)	82% (15 to 100%)

No significant differences were found across groups using t-test.

Table 8. Baseline Recommended Intervention Level among Non-Reentry and Reentry Adults (N=55)

Functional Domain	Recommended Intervention Level	Adult: Non-Reentry (N=27) % of Consumers	Adult: Reentry (N=28) % of Consumers
Sensory Integration	Essential	19%	11%
	Therapeutic	44%	32%
	Enrichment	37%	57%
Self-Regulation	Essential	52%	25%
	Therapeutic	30%	46%
	Enrichment	18%	29%
Relational	Essential	48%	36%
	Therapeutic	33%	36%
	Enrichment	19%	28%
Cognitive	Essential	4%	14%
	Therapeutic	37%	25%
	Enrichment	59%	61%

No significant differences were found across groups using chi-square test.



Appendix II. Changes in NMT Scores Across Target Populations

Adults compared to TAY

Table 9. Type of Change in Functional Domain Scores among Adults and TAY (N=28)

Functional Domain	Change in Scores	Adult (N=24)	TAY (N=22)
		% of Consumers	% of Consumers
Total Brain Map	Decrease	37%	27%
	Maintain	-	-
	Increase	63%	73%
Sensory Integration	Decrease	21%	32%
	Maintain	29%	5%
	Increase	50%	64%
Self-Regulation	Decrease	37%	27%
	Maintain	13%	-
	Increase	50%	73%
Relational	Decrease	42%	41%
	Maintain	8%	4%
	Increase	50%	55%
Cognitive	Decrease	33%	23%
	Maintain	13%	9%
	Increase	54%	68%

No significant differences were found across groups using chi-square test.

Table 10. Average Change in Functional Domain Scores among Adults and TAY (N=28)

Functional Domain	Adult (N=24)	TAY (N=22)
	Average Change (Range)	Average Change (Range)
Total Brain Map	2% (-13 to +23%)	5% (-9 to +25%)
Sensory Integration	3% (-7 to +25%)	3% (-10 to +22%)
Self-Regulation	3% (-11 to +28%)	6% (-8 to +30%)
Relational	3% (-14 to +30%)	5% (-9 to +30%)
Cognitive	0% (-26 to +13%)	4% (-9 to +25%)

No significant differences were found across groups using t-test.



Non-Reentry compared to Reentry Adults

Table 11. Type of Change in Functional Domain Scores among Adults and TAY (N=24)

Functional Domain	Change in Scores	Adult: Non-Reentry (N=11) % of Consumers	Adult: Reentry (N=13) % of Consumers
Total Brain Map	Decrease	45%	31%
	Maintain	-	-
	Increase	55%	69%
Sensory Integration	Decrease	36%	8%
	Maintain	-	54%
	Increase	64%	38%
Self-Regulation	Decrease	45%	31%
	Maintain	8%	18%
	Increase	36%	62%
Relational	Decrease	55%	31%
	Maintain	9%	7%
	Increase	36%	62%
Cognitive	Decrease	31%	36%
	Maintain	-	23%
	Increase	63%	46%

No significant differences were found across groups using chi-square test.

Table 12. Average Change in Functional Domain Scores among Non-Reentry and Reentry Adults (N=24)

Functional Domain	Adult: Not Reentry (N=11) Average Change (Range)	Adult: Reentry (N=13) Average Change (Range)
Total Brain Map	2% (-13 to +23%)	2% (-6 to +14%)
Sensory Integration	3% (-7 to +25%)	2% (-3 to +14%)
Self-Regulation	3% (-11 to +28%)	3% (-11 to +19%)
Relational	3% (-13 to +30%)	3% (-14 to +14%)
Cognitive	0% (-26 to +13%)	0% (-15 to +13%)

No significant differences were found across groups using t-test.